REMARKS

The Examiner has objected to the drawings for not showing an optical frequency mixer. The mixer is shown as waveguide 12 in the figure. The figure clearly shows arrows indicating light traveling within the waveguide. The mixing function of the waveguide is discussed on pages 6 and 7 of the above entitled application which states:

> "When current flows through element 16 and 18, optical gain is provided at two distinct wavelengths. As a result, laser beams at the gain frequencies of elements 16 and 18 which propagate along the length of optical waveguide 12 are generated.
>
> The non-linear susceptibility of the semiconductors used to fabricate optical waveguide 12 creates a wave of polarization at the difference frequency between the two waves generated by elements 16 and 18."

The Specification clearly describes the generation of light at two different frequencies, and a polarization wave with a difference frequency created within the waveguide 12. As further discussed on pages 9 and 10 of the above entitled application, this polarization wave has a frequency ω_3. The semiconductor laser has a diffraction grating which phase modulates the polarization wave to generate an electromagnetic wave having the same ω_3 frequency.

The Examiner rejected claims 1-14 under 35 U.S.C. § 103(e) as being anticipated by Evans. As noted by the Examiner, Evans discloses two different gain elements, a waveguide and a phase grating. The Applicant is not claiming a device with these four components. What is disclosed and claimed is at semiconductor laser that mixes lights of different frequency to generate a polarization wave at a third frequency. This polarization wave is then phase modulated to create emitted light that is at the third frequency. Evans

does not disclose the mixing of light beams and a modulation of the resultant polarization wave to create an output light beam at a third frequency.

Col. 8 of Evans does discuss gratings with different periods. The different periods would produce light with different wavelengths. But the result is the emission of two light beams with different wavelengths. Evan does not disclose the mixing of these beams to create a polarization wave at a third frequency. For example, Col. 8, lines 58-64 of Evans states:

> "For example, if the two lasers have different feedback grating periods, they will each generate a different wavelength of light. But <u>both</u> lasers can emit their light normal to the surface of their respective outcoupling grating by choosing each individual outcoupling grating to couple the necessary wavelength of light out normal to the surface." (emphasis added)

What Evans is describing is two different lasers, each with their own output grating to create two beams of light each having a different frequency. Evans does not disclose or suggest emitting a single beam of light at a third frequency created from the mixing of two beams of light. For these reasons, the Applicant submits that the claims are patentably distinct from Evans.

The Examiner rejected claims 1, 3, 6, 8, 11 and 13 under 35 U.S.C. 102(b) as being anticipated by Uchida. Uchida suffers from the same deficiencies as Evans. Although Uchida discloses different gain elements, waveguides and a grating, it does not disclose a particular cooperation of these components to mix lights from different frequencies to generate a polarization wave and then modulating the polarization wave to create an output beam at a third frequency as claimed in the above entitled application. It is not inherent that

Uchida would disclose the mixing and modulation of beams and waves merely because it contains a waveguide and a grating. Uchida does not disclose or suggest the structure and methods recited in claims 1, 3, 6, 8, 11 and 13.

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections is requested. Allowance of claims 1-14 at an early date is solicited.

Respectfully submitted,

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Susan M Langworthy May 31, 2006

Susan M. Langworthy Date